REMARKS

Claims 25-33 are pending.

The support for the claim amendments are as follows: Claim 25: (p.36, line 4 to p.38, line 2); Claim 26: (p.28, lines 7-19; Examples 11-12, 18-19, and 25); Claim 27: (Examples 13-17, 20 and 22); Claim 28: (Example 21) and Claim 29: (p.36, line 4 to p.38, line 2). The applicant respectfully submits that no new matter has been added. It is believed that this Amendment is fully responsive to the Office Action dated October 13, 2006.

Examiner notes that applicants have not updated the relationship of the instant application to its parent application that has matured in to a US patent. Examiner urges applicants to amend said information by providing the US patent number in response to this Office action. (Office Action, p. 2)

Applicant respectfully submits that the amendment to the specification obviates the objection. Accordingly, withdrawal of the objection to the specification is respectfully solicited.

Claims 26-28 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention. (Office Action, p. 2)

Claims 26-28 have been amended to clarify the terms "functionality" and "improved" as suggested by the Examiner.

Claims 25-34 are rejected under 35 U.S.C. 112, first paragraph, because the specification, does not reasonably provide enablement for a method comprising modifying a target protein or peptide with any molecular weight. (Office Action, p. 3).

The Examiner asserts that the application does not provide enablement. In response, the applicants have attached a Declaration to show specifically that the specification does, in fact, provide enablement. Thus for the following reasons, the rejection should be withdrawn:

The nucleotide sequence of the deamidation enzyme of the present application, *Chryseobacterium gleum,* and that of related application No. 09/727,769, *Chryseobacterium* sp. No. 9670, have about 80% homology. This is compelling evidence that the percent homology is a good basis on which to predict function.

Furthermore, the hybridization method is to obtain DNA having nucleotide homology with the template DNA by utilizing the ability to form double strands. Because this method utilizes the sequence actually obtained (Seq. No. 5), one skilled in the art expects that sequences having a high homology can be obtained.

Either of these factors, homology or hybridization, which relies on homology, is the means for narrowing the sequences expected to encode active protein. Once identified, the homologous sequence is more likely to have the activity recited in the claims. A simple screening method, as outlined in the specification, can be used to confirm the activity.

Based on this showing and the Declaration, it is requested that the rejection be reconsidered and withdrawn.

Claims 25-34 are rejected under 35 U.S.C. 112, first paragraph, as containing subject matter which was not described in the specification. Claims 25-34 are rejected under this section of 35 U.S.C. 112 because the claims are directed to a method of use of a genus of polypeptides derived from SEQ ID NO: 6 including modified polypeptide sequences, modified by at least one of deletion, addition, insertion and substitution of an amino acid residue in SEQ ID NO: 6 and fragments of SEQ ID NO: 6 that have not been disclosed in the specification. (Office Action, p. 6)

The proper SEQ ID No. has been clarified in claims 25 and 29 thereby overcoming this rejection.

Claims 25-28 are rejected under 35 U.S.C. 102(b) as being anticipated by Vaintraub et al. (Office Action, p. 7)

As clearly explained in the specification on p.4, line 15 to p.5, line 13 Vaintraub cannot legally anticipate the invention as now claimed:

> There is an [sic] report suggesting existence of an enzyme originating from plant seed, which catalyzes deamidation of protein (cf. I.A. **Vaintraub,** L.V. Kotova, R. Shara, *FEBS Letter*, Vol. 302. 169-171 (1988)). Although this report observed ammonia release from protein using a partially purified enzyme sample, it is clear that this report does not prove existence of an enzyme of the present invention from [sic] the following reasons. **In this report, a partially purified enzyme sample was used, inexistence of protease activity was not confirmed, and no change in molecular weight of substrate protein after the reaction was not confirmed. Accordingly, this report does not exclude the**

> **possibility that plural enzymes (not one enzyme) such as protease, peptidase, etc. acted on protein** to release glutamine/asparagine as free amino acids and ammonia was released by glutaminase/asparaginase which deamidate these free amino acids. Similarly, there is a possibility that glutamine-containing low molecular weight peptide produced in a similar way is deamidated by peptideglutaminase-like enzyme. **In addition, there is a possibility that deamidation occurred as a side-reaction by protease.** In particular, it should be noted that this report clearly describes that the partially purified preparation had glutaminase activity which acted on free glutamine to release ammonia. (emphasis added)

In short, the enzyme preparation of Vaintraub et al. is obtained from plant seeds at the germination stage and thus cannot anticipate the microorganism product of the claimed invention. High amounts of protease and peptidase are expressed in seeds at the germination stage. Because the enzyme preparation of **Vaintraub** et al. is a **partially purified** product (refer to Fig.l), there is a possibility that the deamidation activity observed by **Vaintraub et al. is based on the contaminated protease** alone or the contaminated protease with peptidoglutaminase and/or glutaminase.

Plant seeds generally contain reserve proteins that have a high amount of amido groups, such as gluten. Accordingly, one skilled in the art might consider the existence of a protein-deamidating enzyme in plant seeds based on the assumption that such enzyme would be required to assimilate the nitrogen derived from the amido groups. However, this is not the same for the microorganisms.

The enzyme preparation acts upon the amido group of free glutamine or of

glutamine residue in protein (see p. 171, first paragraph). In contrast, the enzyme defined in the claims of the present application act upon the amido groups in protein or peptide, **but it does not act upon the amido group of free glutamine** (see the bottom three lines of p. 51, lines 20-26 of the specification).

Considering the showing above, the enzyme defined in the claims of the present application is definitely different from the enzyme preparation of Vaintraub et al. Accordingly, the invention of claims 28-34 is not legally anticipated by Vaintraub et al. In light of this, it is respectfully requested that the rejection be withdrawn.

Claims 29-34 are rejected under 35 U.S.C. 103(a) as being unpatentable over Vaintraub et al. as applied to claims 25-28 above, and further in view of Hamada et al. US5,082,672, issued Jan 21, 1992 and Gottmann et al. (US 5,279,839 issued Jan 18, 1994). (Office Action, p. 9)

The claims 29-32 are directed to a method for controlling a transglutaminase reaction. It is difficult to control the cross-linking, reaction of the transglutaminase. This is the reason why it has been difficult to obtain a product having desired cross-linking degree and functionality in response to respective use and object. **The enzyme recited in the claims has the ability to terminate the transglutaminase reaction at a desired stage by converting gluatmine residues which are the target of the transglutaminase reaction in the substrate protein into glutamic acid residues (see page 32, line 3 to page 33, line 16).** This specific utility of the enzyme was first recognized by the present inventor. **None of the cited references disclose or suggest**

this utility. Thus, the invention of the claims 29-32 is not obvious from the cited references.

Claim 33 is directed to a method for modifying a protein or peptide by employing a protein-deamidating enzyme, a protease, and a glutaminase. It is able to produce an excellent liquid seasoning in which a formation of bitter components has been reduced as a result of modification of target proteins or peptides by a protein-deamidating enzyme (see Example 20). **The invention of claim 33 does not use transglutaminase in contrast to Hamada et al. or Gottmann et al.** Thus, the invention of claim 33 cannot be composed by a combination of the cited documents.

In light of the showing of non-obviousness, it is respectfully requested that the rejection be reconsidered and withdrawn.

Claims 25-27 are rejected under 35 U.S.C. 101 as claiming the same invention as that of claims 1-12 of prior U.S. Patent No. 6,756,221. (Office Action, p. 11)

Amended claim 25 introduces a limitation of molecular weight to the target protein or peptide (5,000 or more) and thus claims 25-27 are now not patentably similar to claims 1-12 of USP 6,756,221.

In view of the aforementioned amendments and accompanying remarks, claims 25-33, as amended, are in condition for allowance, which action, at an early date, is requested.

If, for any reason, it is felt that this application is not now in condition for allowance, the Examiner is requested to contact the applicant's undersigned attorney at the telephone number indicated below to arrange for an interview to expedite the disposition of this case.

In the event that this paper is not timely filed, the applicant respectfully petitions for an appropriate extension of time. Please charge any fees for such an extension of time and any other fees which may be due with respect to this paper, to Deposit Account No. 01-2340.

Respectfully submitted,

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PATENT TRADEMARK OFFICE

Enclosure: Inventor's Declaration (3 pages)

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